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10/091,251	03/05/2002	Christian Stoller	20.2732	6733

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EXAMINER	
HANNAHER, CONSTANTINE	
ART UNIT	**PAPER NUMBER**
2878	

DATE MAILED: 04/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO 90C (Rev 10/03)

Office Action Summary	Application No.	Applicant(s)
	10/091,251	STOLLER ET AL.
	Examiner	**Art Unit**
	Constantine Hannaher	2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 26 January 2004.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1,3-21 and 23-43 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,3-21 and 23-43 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date Jan 2004.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 3, 6, 4, 5, 19, 20, 21, 23-27, 30, 29, 42, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Supernaw *et al.* (US005065016A) in view of Wraight *et al.* (US004879463A) and Daniel *et al.* (US005481114A).

With respect to independent claim 1, Supernaw *et al.* discloses a system (Fig. **1**) for detecting radiation phenomena in an area surrounding a wellbore **12** traversing an earth formation **14** comprising an elongated support member **S** adapted for disposal within the wellbore **12** and multiple radiation detectors **34, 36** mounted on the support member, but one detector is not disposed within another (Fig. **3**) and multiple "types" of radiation phenomena measurements are not provided. Wraight *et al.* shows that the provision of multiple types of radiation phenomena measurements is

known in the art of wellbore tools (Fig. **3B** and column 10, lines 19-25) and in view of the additional information regarding the formation composition achieved thereby (*e.g.*, column 10, lines 43-51) it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the multiple radiation detectors of Supernaw *et al.* to simultaneously provide multiple types of radiation phenomena measurements. Daniel *et al.* shows that disposing one radiation detector within another radiation detector to simultaneously provide multiple types of radiation phenomena measurements is also known in the art of radiation measurement (Fig. **1** and column 3, line 55 to column 4, line 18) and in view of the simultaneous measurements of separate types of radiation phenomena with simplified electronic processing suitable for use in the "geological" field (column 4, lines 39-49) as required by the combination of Supernaw *et al.* and Wraight *et al.* it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the multiple detectors of Supernaw *et al.* to have the disposition suggested by Daniel *et al.*

With respect to dependent claim 3, the system of Supernaw *et al.* further comprises a radiation source **30** mounted on the support member **S**.

With respect to dependent claim 6, the radiation source **30** in the system of Supernaw *et al.* comprises a source of the recited type (column 2, lines 28-33).

With respect to dependent claim 4, the detector of the type recited suggested by Supernaw *et al.*, Wraight *et al.*, and Daniel *et al.* is adapted to detect neutron related phenomena.

With respect to dependent claim 5, the support member **S** in the system of Supernaw *et al.* is adapted for disposal within the wellbore **12** after drilling of the wellbore.

With respect to dependent claim 19, the detector of the type recited suggested by Supernaw *et al.*, Wraight *et al.*, and Daniel *et al.* is adapted to detect neutrons.

With respect to dependent claim 20, the detector of the type recited suggested by Supernaw *et al.*, Wraight *et al.*, and Daniel *et al.* is adapted to detect gamma rays.

With respect to independent claim 21, Supernaw *et al.* discloses a method corresponding to the illustrated system (Fig. **1**) for detecting radiation phenomena in an area surrounding a wellbore **12** traversing an earth formation **14** comprising disposing a support member **S** within the wellbore **12** and having multiple radiation detectors **34**, **36** mounted thereon and detecting radiation phenomena with one of the radiation detectors but one detector is not disposed within another (Fig. **3**) and multiple "types" of radiation phenomena measurements are not provided. Wraight *et al.* shows that the provision of multiple types of radiation phenomena measurements is known in the art of wellbore tools (Fig. **3B** and column 10, lines 19-25) and in view of the additional information regarding the formation composition achieved thereby (*e.g.*, column 10, lines 43-51) it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Supernaw *et al.* to simultaneously provide multiple types of radiation phenomena measurements. Daniel *et al.* shows that disposing one radiation detector within another radiation detector to simultaneously provide multiple types of radiation phenomena measurements is also known in the art of radiation measurement (Fig. **1** and column 3, line 55 to column 4, line 18) and in view of the simultaneous measurements of separate types of radiation phenomena with simplified electronic processing suitable for use in the "geological" field (column 4, lines 39-49) as required by the combination of Supernaw *et al.* and Wraight *et al.* it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Supernaw *et al.* to have the disposition suggested by Daniel *et al.*

With respect to dependent claim 23, the detector of the type recited suggested by Supernaw *et al.*, Wraight *et al.*, and Daniel *et al.* is adapted to detect neutron related phenomena.

With respect to dependent claim 24, the radiation detecting step in the method of Supernaw *et al.* comprises detecting gamma ray related phenomena (column 2, lines 36-37).

With respect to dependent claim 25, the support member **S** in the method of Supernaw *et al.* further comprises a radiation source **30** disposed thereon.

With respect to dependent claim 26, the radiation source **30** in the method of Supernaw *et al.* is a neutron source (column 2, line 15).

With respect to dependent claim 27, the method of Supernaw *et al.* further comprises irradiating the formation **14** with neutrons from the neutron source **30** (column 2, lines 15-17).

With respect to dependent claim 30, the neutron source **30** in the method of Supernaw *et al.* is adapted to emit in the recited manner (column 2, lines 28-33).

With respect to dependent claim 29, the support member **S** in the method of Supernaw *et al.* is disposed in the wellbore **12** after drilling of the wellbore.

With respect to dependent claim 42, the detector of the type recited suggested by Supernaw *et al.*, Wraight *et al.*, and Daniel *et al.* is adapted to detect neutrons.

With respect to dependent claim 43, the detector of the type recited suggested by Supernaw *et al.*, Wraight *et al.*, and Daniel *et al.* is adapted to detect gamma rays.

4. Claims 1, 3, 5, 9, 13-18, 21, 24, 25, 28, 32, 36-41, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paske *et al.* (US004829176A) in view of Wraight *et al.* (US004879463A) and Daniel *et al.* (US005481114A).

With respect to independent claim 1, Paske *et al.* discloses a system (Fig. **1**) for detecting radiation phenomena in an area surrounding a wellbore traversing an earth formation comprising an elongated support member **10** adapted for disposal within the wellbore and multiple radiation detectors **26, 28, 30, 32** mounted on the support member, but one detector is not disposed within

another (Fig. **3**) and multiple "types" of radiation phenomena measurements are not provided. Wraight *et al.* shows that the provision of multiple types of radiation phenomena measurements is known in the art of wellbore tools (Fig. **3B** and column 10, lines 19-25) and in view of the additional information regarding the formation composition achieved thereby (*e.g.*, column 10, lines 43-51) it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the multiple radiation detectors of Paske *et al.* to simultaneously provide multiple types of radiation phenomena measurements. Daniel *et al.* shows that disposing one radiation detector within another radiation detector to simultaneously provide multiple types of radiation phenomena measurements is also known in the art of radiation measurement (Fig. **1** and column 3, line 55 to column 4, line 18) and in view of the simultaneous measurements of separate types of radiation phenomena with simplified electronic processing suitable for use in the "geological" field (column 4, lines 39-49) as required by the combination of Paske *et al.* and Wraight *et al.* it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the multiple detectors of Paske *et al.* to have the disposition suggested by Daniel *et al.*

With respect to dependent claim 3, the system of Paske *et al.* further comprises a radiation source **20** mounted on the support member **10**.

With respect to dependent claim 5, the support member **10** in the system of Paske *et al.* is adapted for disposal within the wellbore during drilling of the wellbore.

With respect to dependent claim 9, the segmented detector in the system of Paske *et al.* is adapted to provide azimuthal sensitivity about the support member **10**.

With respect to dependent claim 13, the support member **10** in the system of Paske *et al.* comprises a plurality of radiation detector (pairs) adapted such that their individual sensitivities are focused about differing orientations relative to the support member (column 4, lines 1-11).

With respect to dependent claim 14, the plurality of focused radiation detectors in the system of Paske *et al.* are disposed on the support member **10** such that they provide continuous azimuthal radiation detection about the support member **10** (Fig. **3**).

With respect to dependent claim 15, each detector in the system of Paske *et al.* of the plurality of focused radiation detectors comprises a shielded (column 3, lines 52-57) scintillation crystal (column 3, line 62). Each shield **22, 24** is adapted to block the passage of radiation therethrough.

With respect to dependent claim 16, each detector in the system of Paske *et al.* of the plurality of detectors is positioned axially proximate another one of the detectors along the support member **10** (Fig. **2**).

With respect to dependent claim 17, the choice of shape for the scintillation crystals in the system of Paske *et al.* is one within the ordinary skill in the art consistent with the requirements of the support member diameter (space) and the arrangement (performance). Cylindrical scintillation crystals are a routine item of commerce as plainly suggested by Daniel *et al.*

With respect to dependent claim 18, each shield in the system of Paske *et al.* defines an arc of 360 degrees which encompasses the claimed value. Note further that the structure of the support member may be considered as defining an arc of specifically 90 degrees.

With respect to independent claim 21, Paske *et al.* discloses a method corresponding to the illustrated system (Fig. **1**) for detecting radiation phenomena in an area surrounding a wellbore traversing an earth formation comprising disposing a support member **10** within the wellbore and having multiple radiation detectors **26, 28, 30, 32** mounted thereon and detecting radiation phenomena with one of the radiation detectors, but one detector is not disposed within another (Fig. **3**) and multiple "types" of radiation phenomena measurements are not provided. Wraight *et al.*

shows that the provision of multiple types of radiation phenomena measurements is known in the art of wellbore tools (Fig. **3B** and column 10, lines 19-25) and in view of the additional information regarding the formation composition achieved thereby (*e.g.*, column 10, lines 43-51) it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Paske *et al.* to simultaneously provide multiple types of radiation phenomena measurements. Daniel *et al.* shows that disposing one radiation detector within another radiation detector to simultaneously provide multiple types of radiation phenomena measurements is also known in the art of radiation measurement (Fig. **1** and column 3, line 55 to column 4, line 18) and in view of the simultaneous measurements of separate types of radiation phenomena with simplified electronic processing suitable for use in the "geological" field (column 4, lines 39-49) as required by the combination of Paske *et al.* and Wraight *et al.* it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Paske *et al.* to have the disposition suggested by Daniel *et al.*

With respect to dependent claim 24, the radiation detecting step in the method of Paske *et al.* comprises detecting gamma ray related phenomena (column 3, lines 9-11).

With respect to dependent claim 25, the support member **10** in the method of Paske *et al.* further comprises a radiation source **20** disposed thereon.

With respect to dependent claim 28, the support member **10** in the method of Paske *et al.* is disposed in the wellbore during drilling of the wellbore.

With respect to dependent claim 32, the segmented detector in the method of Paske *et al.* is adapted to provide azimuthal sensitivity about the support member **10**.

With respect to dependent claim 36, the support member **10** in the method of Paske *et al.* comprises a plurality of radiation detector (pairs) adapted such that their individual sensitivities are focused about differing orientations relative to the support member (column 4, lines 1-11).

With respect to dependent claim 37, the plurality of focused radiation detectors in the method of Paske *et al.* are disposed on the support member **10** such that they provide continuous azimuthal radiation detection about the support member **10** (Fig. **3**).

With respect to dependent claim 38, each detector in the method of Paske *et al.* of the plurality of focused radiation detectors comprises a shielded (column 3, lines 52-57) scintillation crystal (column 3, line 62). Each shield **22, 24** is adapted to block the passage of radiation therethrough.

With respect to dependent claim 39, each detector in the method of Paske *et al.* of the plurality of detectors is positioned axially proximate another one of the detectors along the support member **10** (Fig. 2).

With respect to dependent claim 40, the choice of shape for the scintillation crystals in the method of Paske *et al.* is one within the ordinary skill in the art consistent with the requirements of the support member diameter (space) and the arrangement (performance). Cylindrical scintillation crystals are a routine item of commerce as plainly suggested by Daniel *et al.*

With respect to dependent claim 41, each shield in the method of Paske *et al.* defines an arc of 360 degrees which encompasses the claimed value. Note further that the structure of the support member may be considered as defining an arc of specifically 90 degrees.

With respect to dependent claim 43, at least one of the detectors of the method of Paske *et al.* is adapted to detect gamma rays.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Supernaw *et al.* (US005065016A), Wraight *et al.* (US004879463A) and Daniel *et al.* (US005481114A) as applied to claim 3 above, and further in view of Stoller *et al.* (US005841135A).

With respect to dependent claim 7, Stoller *et al.* shows that it is known to use a radiation source comprising an x ray source (column 6, lines 56-57) in a system for detecting radiation phenomena in an area surrounding a wellbore traversing an earth formation wherein at least one of the detectors is adapted to detect gamma ray related phenomena. In view of the opportunity for evaluating different aspects of the wellbore and/or formation, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Supernaw *et al.*, Wraight *et al.*, and Daniel *et al.* to comprise an x ray source as a radiation source mounted on the support member S.

6. Claims 8 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Supernaw *et al.* (US005065016A), Wraight *et al.* (US004879463A) and Daniel *et al.* (US005481114A) as applied to claims 1 and 21 above, and further in view of Pauley *et al.* (US005191210A).

With respect to dependent claim 8, the provision of a marker material of the type recited is known from Pauley *et al.* In view of the ability to measure velocity and volume and the like as described by Pauley *et al.*, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Supernaw *et al.*, Wraight *et al.*, and Daniel *et al.* to further comprise such a marker material.

With respect to dependent claim 31, the provision of a marker material of the type recited is known from Pauley *et al.* In view of the ability to measure velocity and volume and the like as described by Pauley *et al.*, it would have been obvious to one of ordinary skill in the art at the time

the invention was made to modify the method of Supernaw *et al.*, Wraight *et al.*, and Daniel *et al.* to further comprise such a marker material.

7. Claims 9-12 and 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Supernaw *et al.* (US005065016A), Wraight *et al.* (US004879463A) and Daniel *et al.* (US005481114A) as applied to claims 1 and 21 above, and further in view of Williams (US004743755A).

With respect to dependent claim 9, the detector (*e.g.*, **34**) in the system of Supernaw *et al.* is segmented (Fig. **3**) and the detector of Wraight *et al.* has angular sensitivity (column 10, lines 38-42). Williams shows explicitly (by comparison with Fig. **1** therein) that it is an improvement on the detector of Supernaw *et al.* to provide focused sensitivity, and specifically azimuthal sensitivity about a support member **10**, using a segmented detector as disclosed therein. In view of the improved ability to determine the location of flows as described by Williams, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector in the system of Supernaw *et al.*, Wraight *et al.*, and Daniel *et al.* to provide azimuthal sensitivity.

With respect to dependent claims 10-12, the segmented detector suggested by Williams comprises scintillation material segments **57**, barrier material **55**, and multiplier **58** in the recited arrangements.

With respect to dependent claim 32, nevertheless the detector (*e.g.*, **34**) in the method of Supernaw *et al.* is segmented (Fig. **3**) and the detector of Wraight *et al.* has angular sensitivity (column 10, lines 38-42). Williams shows explicitly (by comparison with Fig. **1** therein) that it is an improvement on the detector of Supernaw *et al.* to provide focused sensitivity, and specifically azimuthal sensitivity about a support member **10**, using a segmented detector as disclosed therein. In view of the improved ability to determine the location of flows as described by Williams, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify

the segmented detector in the method of Supernaw *et al.*, Wraight *et al.*, and Daniel *et al.* to provide azimuthal sensitivity.

With respect to dependent claims 33-35, the segmented detector suggested by Williams comprises scintillation material segments **57**, barrier material **55**, and multiplier **58** in the recited arrangements.

Response to Submission(s)

8. The amendment filed January 26, 2004 has been entered.

9. Applicant's arguments with respect to claims 1, 3-21, and 23-43 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Peters (US003566118A) shows that disposing one radiation detector within another radiation detector to simultaneously provide multiple types of radiation phenomena measurements has long been known.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be

calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Constantine Hannaher whose telephone number is (571) 272-2437. The examiner can normally be reached on Monday-Friday with flexible hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ch

Constantine Hannaher
Primary Examiner